Arizona Department of Health Services

REPORT TO ADHS WITHIN 24 HOURS

Measles-Quick Sheet

Infectious agent: The measles virus is a paramyxovirus, genus *Morbillivirus*
Mode of transmission: a) Direct contact with infectious droplets or b) Airborne spread (tiny droplets suspended in the air for 2 hours or more)
Period of Communicability: One day prior to prodrome (4 days before rash onset) to 4 days after rash onset

CDC Case and Classification *(for purposes of public health reporting)*

Clinical Case Definition
□ A generalized maculopapular rash of **at least 3 days duration**, **AND**
□ A fever **equal to or greater than** 101 degrees Fahrenheit (orally), **AND**
□ **Cough** or □ **coryza** or □ **conjunctivitis**

Laboratory Criteria for Diagnosis
□ Significant IgM measles antibody in serum collected 2-28 days after rash onset
□ Significant rise in measles IgG in paired and acute convalescent sera drawn two weeks apart
□ Detection of measles nucleic acid via PCR in nasopharyngeal and/or urine specimens
□ Virus isolation by urine (collected within 14 days of rash onset) or nasopharyngeal specimen (collected within 5 days of rash onset)

Specimens to Collect (forward all specimens to Arizona State Laboratory)
When investigating a suspect measles, collect the following specimens:

- □**Whole blood (red top tube) or serum** (collect specimens at the same time as other viral specimens, highly suspect cases that test negative on a blood specimen drawn within 72 hours of rash onset should be retested)
- □**Nasopharyngeal swab in Hank's solution** (ASAP and no later than 5 days post rash onset) – (see "Instructions for Collecting Nasopharyngeal Swab Specimens" document)
- □**Urine** (ASAP and no later than 14 days after rash onset).

Case Classification
□**Confirmed:** laboratory confirmed or meets clinical case definition, and is epidemiologically linked to another confirmed case. A laboratory confirmed case does not need to meet the clinical case definition.
□**Probable:** meets clinical case definition and has noncontributory or serologic or virologic testing, and is not epidemiologically linked to a confirmed case.
□**Suspected:** any rash illness with fever.

Clinical Features

Subclinical Infection
The role of subclinical infection is unknown.

Incubation
Time between exposure to prodrome averages 10-12 days while exposure to onset of rash averages 14 days (maximum range 7-18 days).

Prodrome
Begins 10-12 days after exposure to virus; generally lasts 2-4 days, with a maximum range of 1-7 days. Fever and malaise for about 24 hours; fever gradually increases often as high as 103-105 degrees F. Cough, coryza (runny nose), and conjunctivitis generally present. Koplik's spots may occur 1-2 days before rash to 1-2 days after rash. They appear as pinpoint, raised, blue- white spots on bright red background on the buccal mucosa.

Rash
Maculopapular, usually lasting 5-6 days that begins at the hairline, then involves the face and upper neck. During the next three days, gradually proceeds downward and outward, reaching extremities last and being less pronounced on hands and feet. The rash usually becomes confluent on face and chest then fades in the same order that it appears, from head to feet.

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Recommended Treatment and Chemoprophylaxis

Treatment	*Children*	*Adults*
Immune Globulin (IG)	Give within six days of exposure to infants less than 1 year old w/o previous measles vaccine. IM dose is 0.25 mL/kg of body weight (0.5 mL/kg for immunocompromised children) with a maximum dose of 15 mL	Appropriate for known or presumed susceptible pregnant women or immunocompromised persons. IM dose is 0.25 mL/kg of body weight (0.5 mL/kg for immunocompromised children) with a maximum dose of 15 mL.
Measles Vaccine (MMR)	Appropriate for any child without 2 previous measles vaccine doses, if given within 72 hours of exposure.	Appropriate for any adult without 2 previous measles vaccine doses (1 dose if born before 1957), if given within 72 hours of last exposure.

Measles Immunity

Proof of measles immunity is determined by meeting one of the following criteria:
- Documentation of having received two doses of live virus measles vaccine, the first dose on or after 12 months of age and the second dose at least 30 days after the first.
- Serological evidence of measles antibodies
- Diagnosis of having had measles disease as documented by a physician

Other Measles Syndromes

Atypical measles **and** ***modified measles*** are two syndromes frequently misinterpreted in measles surveillance and investigation. These terms should not be generalized or attributed to a rash/febrile illness not consistent with the CDC case definition for measles.

By definition:
- **Atypical measles** syndrome (centripetal rash, lymphadenopathy) occurs only in persons who are infected with natural measles after they received killed measles vaccine (KMV). (600,000-900,000 persons received KMV in the U.S. from 1963-1967)
- **Modified (mild) measles** syndrome occurs primarily in patients who received immune globulin (IG) as post-exposure prophylaxis and in young infants who may have some residual maternal antibody.

Measles Case Investigation

Reporting of measles is **mandated** under the Arizona Administrative Code *(R9-6-350).* All confirmed, probable and suspected cases must be reported to ADHS using both the Rash Illness Investigation Form and the Communicable Disease Reporting Form.

Investigation checklist:

1. Upon notification of a measles suspect, interview patient and provider to obtain following information:
   - demographic information
   - information regarding clinical signs and symptoms (such as: rash onset, fever, cough, coryza, and/or conjunctivitis, etc)
   - all pertinent medical information (recent medications, physician information, etc.)
   - information regarding patient's immune status (history of measles vaccination)
   - information regarding the possible source of exposure (within two weeks prior to rash onset):
     - contact with a person who is suspected of having measles or who has a febrile/rash illness
     - travel or gathering
     - medical facility
   - a listing of all household contacts and determine those who do and do not have measles immunity
   - a listing of all other contacts (include persons sharing the same air space during the time and for three hours after the case was present and not masked); determine those who do not have measles immunity.
2. Collect laboratory specimens (see "Specimens to Collect" section and forward to the Arizona State Laboratory for measles testing)

3. Notify ADHS as soon as possible and no longer than 24 hours after diagnosis, by contacting the Infectious Disease Epidemiology Section at (602) 364-3676.
4. Exclude suspected case from school/work setting through the fourth day after rash onset.

The following timeline depicts the clinical course of measles and may be useful in an investigation.

Exposure and Incubation Period (7-10 days)			***Rash (5-6 days)***	***Communicability***
weeks: -3	-2	***-1***	RASH ONSET	1
Onset of rash minus 14 days is probable exposure **DATE:** ___/___/___		Onset of rash minus 4 days is probable start of infectious period **DATE:** ___/___/___ **PRODROME:** (2-4 days cough), conjunctivitis, coryza, and Koplik's spots	**DATE:** ___/___/___	Onset of rash plus 4 days is probable end of infectious period **DATE:** ___/___/___

Measles Outbreak Control Recommendations

Live measles vaccine may prevent disease if administered within 72 hours of exposure. Immune globulin (IG) may prevent or modify disease and provide temporary protection if given within six days of exposure.
(see Recommended Treatment and Prophylaxis Guidelines)
The following course of action is recommended to prevent the spread of measles disease:

1. Exclude case through the 4th day after rash onset
2. Determine the type of setting involved (i.e., school, institution, camp, hospital, ER, or doctor's office).
3. Identify contacts who ***do not have measles immunity*** and follow the recommended prophylactic treatment:
   - Individuals 12 months or older should receive one dose of MMR.
   - Individuals 6-12 months should receive one dose of MMR.
   - Individuals 0-6 months should be referred to their pediatrician for recommended treatment with IG.
   - Individuals who are pregnant should be referred to their OB/GYN for recommended treatment with IG.
4. Exclude all persons without documented immunity to measles in an outbreak setting (these persons may be readmitted following receipt of MMR vaccination).
5. Conduct surveillance of contacts for two incubation periods from most recent exposure to case, collect laboratory specimens from symptomatic contacts and forward to Arizona State Laboratory for measles testing.
6. Report **all** suspect and confirmed cases to the ADHS Infectious Disease Epidemiology Section.
7. Refer to *"Sample Measles Alert Letter"* for contact notification in schools or other institutions.